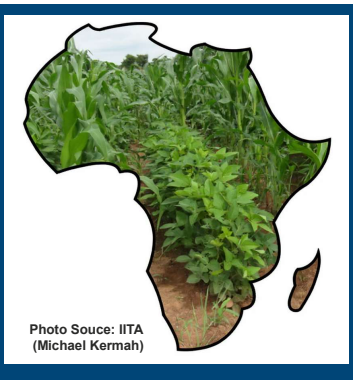

Photo Souce: IITA
(Michael Kermah)

Adaptation of the LUCIA Model to Simulate Maize-Grain Legume Intercropping Systems in Sub-Saharan Africa

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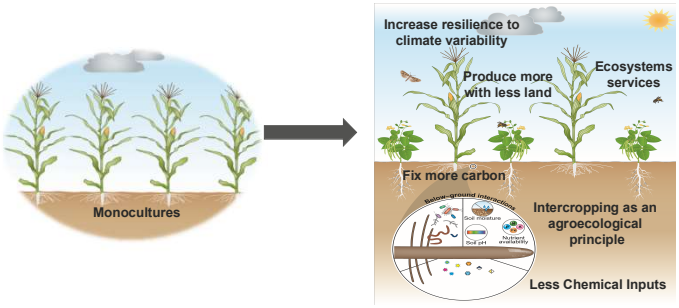
Introduction



- However, the inherent ecological and management complexity of intercropping has prevented widespread adoption across diverse enviroments globally.
- How can we **design, optimise and explore** the viability and productivity of intercropping systems under new environments or climatic conditions without years of trial and error? **'THE ANSWER LIES IN THE APPLICATION OF CROP MODELS'**
- Hence, we **adapt and modify** the existing **LUCIA agroforestry model** to simulate **cereal-legume intercropping systems**, with a specific focus on maize-grain legume systems in **sub-Saharan Africa.**

Conclusion

- **Overall, the LUCIA annual intercrop model performs best in mixed (random) systems and needs improvement in row intercropping.**
- **LUCIA intercrop shows better grain yield predictions across most systems compared to stover.**
- **Biomass partitioning routines should be improved for competitive stress conditions.**
- **Maize simulations were more satisfactory in intercropping while cowpea emerges as a more challenging species to simulate.**

LUCIA Intercrop

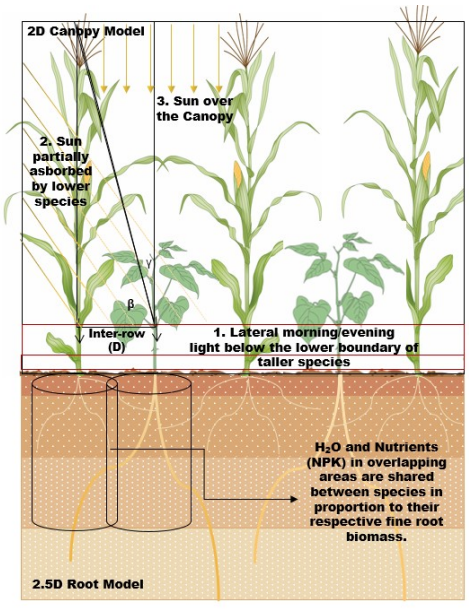


Fig. 1: Conceptual ilustration of LUCIA Intercrop model

Results

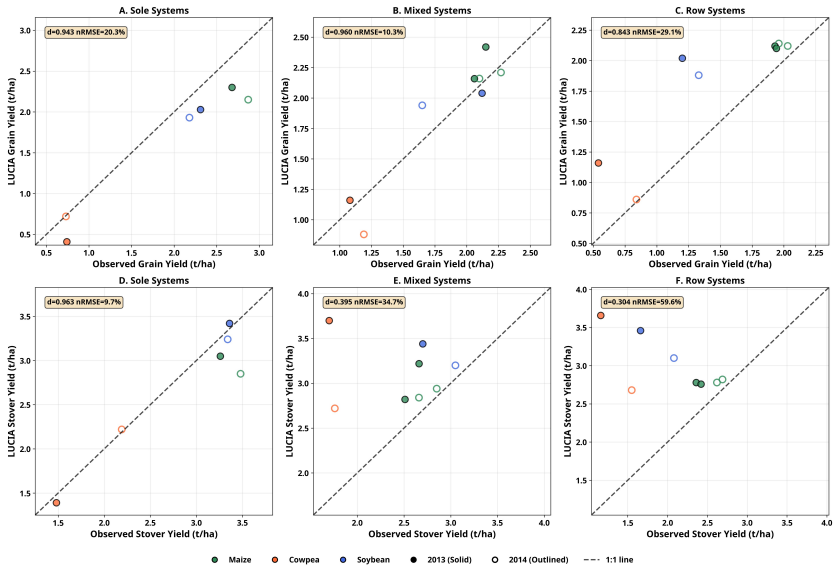


Fig. 2: LUCIA Intercrop model performance: Simulated vs. Observed grain and stover for monocultures and intercrop.

Methodology

GHANA

Karaga District (SGS)

Two Seasons: 2013 & 2014

Species Maize, Soybean and Cowpea

Data: GrainYield, Stover Yield and PAR

LUCIA Model Calibration Sole Crop

Maize Legume

LUCIA Model Validation (Intercrop)

Mixed 1:1

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